REMARKS/ARGUMENTS

Claim Rejections

The Examiner has rejected Claims 1 to 13 and 17 to 19 under 35 U.S.C. 103(a) as being unpatentable over Priddy et al (USP 5,721,320) in view of EP 0892820.

As described in more detail in the application, Applicant claims a mass/solution polymerization process comprising polymerizing a vinyl aromatic monomer in the presence of a functionalized diene rubber having a solution viscosity of from 5 to less than 50 centipoise (cps) wherein the functional group on the rubber enables controlled radical polymerization such that the resulting grafted rubber particles have a broad monomodal size distribution.

Priddy discloses a bulk (mass) polymerization process comprising a rubber carrying a functionalized group enabling controlled radical polymerization with a vinyl aromatic monomer. Priddy is silent as to viscosity of the functionalized rubber. The Examiner acknowledges this on page 3, paragraph 2 of the January 25th Office Action.

Apparently, to provide the rubber viscosity limitation which Priddy lacks, the Examiner relies on EP 0892820. EP 0892820 discloses a process for preparing modified polymers from vinyl aromatic monomers wherein the rubber has a bimodal particle size distribution. However, EP 0892820 is also silent as to the viscosity of the rubbers used in its process.

Neither Priddy nor EP 0892820 teach or suggest any viscosity limitations regarding the rubbers used in their respective inventions. Applicant asserts that it is impossible for one skilled in the art to combine Priddy with EP 0892820 to arrive at Applicant's invention of a polymerization process comprising polymerizing a vinyl aromatic monomer in the presence of a functionalized diene rubber having a solution viscosity of from 5 to less than 50 centipoise (cps) because neither disclose anything about rubber solution viscosity. Applicant asserts that Claims 1 to 13 and 17 to 19 of the present invention are patentable over Priddy in view of EP0892820.

The Examiner makes an argument that smaller rubber particle size improves gloss and that Priddy disclose rubbers having a particular rubber size

(less than 0.1 micron) and that EP 0892820 also discloses rubbers of a similar particle size. The Examiner further states that EP 0892820 teaches smaller rubber particle size improve gloss (higher gloss value). The Examiner states (page 4, paragraph 2-the following is verbatim):

> "It would have been obvious to one of ordinary skill in the art at the time of the invention to use a process for producing a functionalized rubber having particle size of 100 nm and grafting said rubber particles with vinyl aromatic monomer in Priddy invention wherein the small particles of rubber is a benefit to impart high gloss properties as evidence in EP'820; and since reference discloses the analogous process condition, a bulk/solution polymerization, a small rubber particles that impart high gloss property of polybutadiene, the claimed solution viscosity is expected to provide adequate results, whether or not these property is shown or suggested in the prior art."

Is the Examiner suggesting that the mass polymerization process produces rubber having a particle size of only 100 nm? One skilled in the art knows this is not the case.

It is well known in the art that smaller rubber particle size can improve gloss. However, is the Examiner suggesting that the only factor effecting rubber particle size is rubber solution viscosity? One skilled in the art knows this is not the case. This is even addressed in EP 089280 in paragraph 27:

> "The particle size of the rubber particles produced in the first and second prepolymer compositions can be influenced by a number of factors including the rubber used, the amount of grafting, the viscosity and the shear rate. The techniques of mass-polymerization and the conditions needed for producing the desired average particle sizes are well known to one skilled in the art."

Wherein the viscosity mentioned in paragraph 27 could be either or both the viscosity of the matrix polymer and/or the rubber.

Is the Examiner suggesting that rubber solution viscosity of a certain size rubber particle is an inherent property? One skilled in the art knows that it is not. Rubber viscosity depends on as many, if not more, variables than rubber particle size, i.e., type of rubber, homopolymer, copolymer, types of comonomers, block, random, molecular weight, cross linking, morphology, etc.

Is the Examiner suggesting there is some universal correlation between rubber particle size and rubber solution viscosity? There is not.

There in no way one skilled in the art would interpret the cited prior art to arrive at the Examiner's conclusions that Priddy combined with EP0892820 teaches Applicant's process utilizing a functionalized rubber having a solution viscosity of from 5 to less than 50 centipoise (cps).

Conversely, Applicant has shown that (Response A):

(1) Applicant's invention is a selection of a range of functionalized rubbers providing unexpected and improved properties.

(2) Priddy's rubber with a molecular weight of 3,930 is outside of Applicant's claimed range (low side) of a functionalized rubber with a solution viscosity of from 5 to less than 50 cps.

(3) Rubbers having a molecular weight within the range disclosed in Priddy but having a solution viscosity outside of the Applicant's claimed range (high side) do not provide the unexpected improvement in gloss in the resultant rubber modified polymers compared to rubber modified polymers made by the process of the present invention having a solution viscosity within the claimed range.

(4) Neither Priddy nor EP 0892820 teach or suggest Applicant's claimed functionalized rubber having a solution viscosity of from 5 to less than 50 cps.

Applicant asserts that the present invention as claimed in present Claims 1 to 13 and 17 to 19 is inventive and patentable over Priddy in view of EP 0892820.

CONCLUSIONS

In view of the preceding remarks, Applicant believes all grounds of rejection have been fully traversed and Applicant's previously amended Claims 1, 6, 9 , and 10 and original Claims 2 to 5, 7 to 8, 11 to 13, and 17 to 19 are patentable in full. Accordingly, their reconsideration and allowance at the earliest possible convenience is courteously solicited.

Respectfully submitted,

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